## THE SOCIAL LIFE OF A DATA BASE

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# Social Construction of Mechanisms of Memory



- It is well known that memory is socially constructed
  - Studies have examined various mechanisms of social memory:
    - Archives (Trouillot)
    - Memorial Statuary (Nora)
    - Historical Theme Parks (Samuel)
    - Museums (White)
    - Holiday Observances (Connerton, Yerushalmi)
    - Institutional Narrative (Linde)

# Data Bases: The Invisible Memory Mechanism



- Social science has paid little to data bases as socially constructed forms of memory
- Computer data bases are viewed as purely technologi objects
- One might think that social aspect of data bases lies in the processes of their construction
- However, databases are embedded within complex w systems
  - Many continuous forms of human work required to produce and maintain their function

These work practices are invisible to designers and us

#### The Human in the Machine

- This paper shows some of the complex social life of a large data base:
  - Construction of data entries,
  - Human escorting of data within and across organizational boundaries,
  - Ongoing movement between paper and electronic data recording
  - Social practices which compensate for design deficiencies, but also mask their existence.

## Data of the Study: A Large-Scale Problem Reporting Data Base



- We discuss a study of a NASA data base for reporting problems discovered in the inspection and refitting process for the Space Shuttle
  - PRACA (Problem Reporting And Corrective Action)
- PRACA is a complex system, distributed among several NASA centers and contracting organizations.
  - This complexity is not unique to NASA: many public and private institutions maintain enormous data bases, incorporating legacy systems which are resistant to change because their structure is no longer apparent.

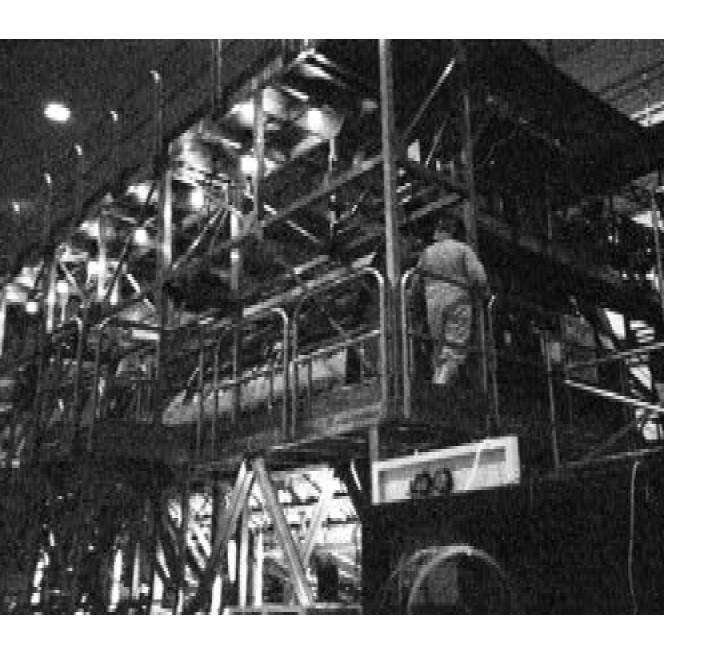
#### The PRACA Study

The study of the work system of PRACA reported on here was part of a larger study mapping the locations, technologies, languages, and institutional responsibilities for PRACA

Purpose: evaluate & quantify the technical aspects of PRACA systems in order to recommend enhancement and future system upgrades.

Method: preliminary study of work practices

- Interviews with data base users and managers at two sites
  - Kennedy Space Center shuttle refitting
  - Johnson Space Center go/no go decision on shuttle flight
- Complete study would involve ethnographic observation





#### **PRACA** and Paper

 PRACA is thought of as a data base, but moves from paper to electrons to paper to conversation at various stages of its use

National Aeronautics and Space Administration  John F. Kennedy Sp	EM REPORTREPORT		PAGE - OF		
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### Multiple Uses of PRACA

- Work Process Scheduling
- Flight Readiness Decision-making
- Statistical Analysis of Part and Process Failures
- Data for Mandated Investigations

#### The Work of PRACA



- Initial Problem Entry
- Checking the form and the work
- Passing the report from KSC to JSC
- Getting report to Deputy Manager for Operation
- Space Shuttle Vehicle Engineering Office –
- (Go/No go decision maker)
- Tracking required repairs
- Using PRACA retrospectively

#### The PRACA Process



shuttle inspection and repair

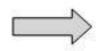
Problems found, paper forms brought to TAIR station



TAIR Station entry of problem report into PRACA

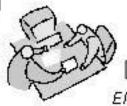
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Boeing California

CAR-electronic Corrective Action Report generated

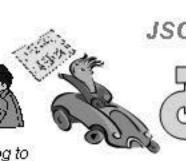


Boeing Houston

Electronic CAR

Problem Action Center

Reviews CAR



Hard copy to JSC







Problems dispositioned Shuttle Launches



Long term trer

# Multiple Forms of Invisibility



- Each of the above uses is invisible to users of all other types
- Paper instantiations of PRACA are invisible to computer designers and users
- Work of making PRACA work is invisible to high-level users

#### Such Systems are Everywhere

This is an outmoded system

- Opaque to users
- Possesses emergent properties not intended by or known to original designers
- No single owner of the design or implementation
   Such systems are more the rule than the exception:
   Legacy data bases are everywhere
  - Legacy data bases imply the existence of complex work practice systems, not just outmoded machines languages



#### Two Morals to the Story

- Data Base Designers and Users
  - Be aware that data entry, interpretation and use are pervasively social activities, part of an integrated work system
- Anthropologists
  - Begin the analysis of these complex memory technologies as a locus for ongoing social activity as well as initial social construction